

I. 45381-65

ACCESSION NR: AP5007009

ENCLOSURE: 01

Table 1

Melt No.	Chemical composition, %					
	C	Mn	Si	Cr	Ni	Ti
1	0.10	0.65	0.60	21.27	5.14	0.65
2	0.11	0.61	0.53	21.00	5.15	0.55

Card 3/3

CHERKASHINA, N.P.; BABAKOV, A.A.

Production of sheet from 1Kh21N5T steel at the Zaporozhstal'
Plant. Metalloved. i term. obr. met. no.3:50-52 Mr '65.
(MIRA 18:10)

1. Zavod "Zaporozhstal'" i Tsentral'nyy nauchno-issledovatel'-
skiy institut chernoy metallurgii imeni I.P. Bardina.

83126

S/078/60/005/009/009/017
B015/B064

18-1200

AUTHORS: Cherkashina, N. V., Nedumov, N. A., Shamray, F. I.
TITLE: Some Data on Alloys of the System Titanium - Chromium - Boron
PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 9,
pp. 2025-2031

TEXT: The phase diagram of the ternary system Ti-Cr-B was investigated; first, the cross sections Cr-Ti₂B and Cr-TiB₂ were studied (Tables 1, 2, composition of the mixtures). The samples were produced by mixing and melting the powders and were investigated both metallographically and with respect to microhardness (on the ПМТ-3 (PMT-3) device), while the alloys Cr-Ti₂B were thermally analyzed with a device described in Refs. 10, 11. Phase transformations were recorded by a differential thermometer (Fig. 1), while temperature was optically measured in an electric furnace (Fig. 2). Figs. 3 and 4 show the microstructure photographs of some alloys, the data of the microhardness of the phases are given in Tables 3 and 4. At 20 at%

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83126

Some Data on Alloys of the System
Titanium - Chromium - Boron

S/078/60/005/009/009/017
B015/B064

Ti₂B or TiB₂ a eutectic occurs in the structure of the alloy. An increase of the Ti₂B or TiB₂ content to more than 20 at% leads to the formation of an excessive boride phase whose microhardness is between 1300 and 2070 kg/mm² depending on the boron content. The results of thermal analysis show that apparently a ternary eutectic occurs in the system Ti-Cr-B whose formation temperature lies somewhat over 1300°C. Its composition could not be stated; it is, however, very likely to lie in the range of 70 at% Cr and 30 at% TiB₂. There are 6 figures, 4 tables, and 11 references: 3 Soviet, 5 US, 1 German, 1 British, and 1 Danish.

SUBMITTED: June 20, 1959

Card 2/2

L 32672-66 EWT(m)/EWP(t)/ETI IJP(c) JD/WW/JG/WB/GD

ACC NR: AT6013571

(N)

SOURCE CODE: UR/0000/65/000/000/0421/0428

AUTHOR: Cherkashina, N. V.; Fedorov, T. F.; Shamray, F. I.

ORG: Institute of Metallurgy im. Baykov (Institut metallurgii)

TITLE: The zirconium-vanadium-boron system

SOURCE: AN UkrSSR. Institut problem materialovedeniya. Vysokotemperaturnyye neorganicheskiye soyedineniya (High temperature inorganic compounds). Kiev, Naukova dumka, 1965, 421-428

TOPIC TAGS: zirconium, vanadium, boron, boride, *METAL PHASE SYSTEM, METAL OXIDATION*

ABSTRACT: The phase structure and oxidation susceptibility of the binary sections, ZrB_2-VB_2 and $Zr-VB_2$, of the Zr-V-B system were investigated by x-ray, microhardness, and gravimetric techniques. The individual diborides were prepared by fusion in a Tamman furnace in a hydrogen atmosphere of the oxides and carbides according to formulas:



The intercomponent molar ratio varied from 1:9 to 9:1 in the case of the ZrB_2-VB_2 system and from 1:19 to 19:1 for the $Zr-VB_2$ system. For all the ratios, the ZrB_2-VB_2 sys-

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L 32672-66

ACC NR: AT6013571

tem was found to be a true two-phase one. After oxidation (1 hour heating in oxygen at 1200°C) the ZrB_2 - VB_2 samples gained 0.5-2.0 weight due to the predominant formation of ZrO_2 . It was found that ZrB_2 contributed to greater oxidation stability of the ZrB_2 - VB_2 alloys. It was found that Zr - VB_2 alloys containing more than 50 mol % Zr had a face-centered lattice with $a=4.618 \text{ kx}$ [where $1 \text{ kx}=1/1.00202 \text{ \AA}$]. Alloys containing 80 and 90 mol % Zr had a cubic face-centered lattice with $a=4.63 \text{ kx}$. When subjected to oxidation at 1200°C all samples of the Zr - VB_2 system corroded throughout and turned in to powder. Orig. art. has: 1 figure, 6 tables, 2 formulas.

SUB CODE: 11/ SUBM DATE: 03Jul65/ ORIG REF: 003/ OTH REF: 008

Card 2/2

BLG

CHERKASHINA, N.P., inzh.; LOLA, V.N., inzh.

Relation of the properties of St. 3kp steel to its composition and temperature of coliling. Stal' 20 no.9:851-855 S '60. (MIRA 13:9)

1. Zavod "Zaporozhstal'".
(Sheet steel) (Rolling (Metalwork))

BARZIY, V.K., inzh.; IOFFE, M.M., inzh.; CHERKASHINA, N.P., inzh.;
ORLOVA, T.I., inzh.

Increasing the corrosion resistance of electrically welded
1Kh18N9T steel pipe. Stal' 22 no.10:944 0'62. (MIRA 15:10)

1. Zaporozhskiy staleplavil'nyy zavod.
(Pipe, Steel—Corrosion)

LAYNER, D.I.; CHERKASHINA, N.V.; BRIK, L.M.

Nature of the unweldability of copper. Trudy Gip'rotsve'tezh-
brabotka no.24:166-171 '65. (MIRA 18:11)

CHERKASHINA, R. A.

AYRAPET'YANTS, E. Sh., zaveduyushchiy; LOBANOVA, L.V.; CHERKASHINA, R.A.

Data on the physiology of the internal analyzer in man. First report:

Internal signals in the excitation of receptors in the human bladder.

Trudy Inst.fiziol. 1:3-20 '52.

(MLRA 6:8)

1. Laboratoriya interotseptivnykh uslovnykh refleksov.

(Nervous system) (Bladder)

CHERKASHINA, R.A.

Interaction of various kinds of internal inhibition. Trudy Inst.vys.
nerv.deiat. Ser.fiziol.1:67-77 '55. (MIRA 9:8)

1. Iz laboratorii vegetativnykh uslovykh reflektov, zaveduyushchiy
M.A.Usiyevich.
(INHIBITION)

CHERKASHINA, R. A.

USSR/Human and Animal Physiology - The Nervous System.

V-10

Abs Jour : Ref Zhur - Biol., No 2, 1958, 9053

Author : R.A. Cherkashina

Inst : The Institute of Higher Nervous Activity

Title : The Interaction of Various Types of Internal Inhibition.
Report 2.

Orig Pub : Tr. In-ta vyssh. nervn. deyat-sti. AN SSSR. Ser. fiziol.,
1956, 2, 59-74

Abstract : By means of the secretion-feeding technique, a study was made on two dogs of the interaction of extinction and differentiation types of inhibition arising in different analysors (skin and sound or sight and sound), as well as in a single analyzor (sound). The simultaneous interaction of various types of internal inhibition led to the intensification of the inhibitory process and to the alteration

Card 1/2

USSR/Human and Animal Physiology - The Nervous System.

V-10

' Abs Jour : Ref Zhur - Biol., No 2, 1958, 9053

of the entire cortical dynamics. The results of the interaction of the various types of internal inhibition were dependent upon the typological properties of the animal and on the spatial relationships of the portions of the cortex which were subjected to the action of inhibitory stimuli (i.e. upon whether the stimuli were directed to one and the same analyzer or to different analyzers).

For Ref.I see Ref. Zhur. Biol., 1956, 32952.

Card 2/2

CHERKASHINA, R. A. Cand Med Sci -- (diss) "Interaction of
various types of internal ^{*inhibition*} ~~inhibitory reflexes~~" Mos, 1957.
15 pp 20 cm. (Inst of Higher Nervous Activity, Acad Sci USSR).
200 copies. (KL, 23-57, 118)

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-143-

CHEKASHINA, R.A.

Interaction of extinctive and differentiating inhibition during
extreme changes in the strength of the inhibiting stimulus.
Trudy Inst. vys. nerv. deiat. Ser. fiziol. 6:153-161 '61.

(MIRA 14:12)

1. Iz Laboratorii vysshey nervnoy deyatel'nosti zhivotnykh,
ispolnyayushchiy obyazannosti zaveduyushchego - A.A.Pavlovskaya.
(CONDITIONED RESPONSE)

CHERKASHINA, T. V.

Determination of molybdenum in the presence of tungsten by chromometric titration. V. G. Chayupshina and T. V. Cherkashina. *Zavodskaya Lab.* 14, 255 (1948). It was shown (Chernikova and G., C. A. 40, 1113; 41, 1172g) that bivalent Cr in const. HCl quantitatively re-

duces Mo^{6+} to Mo^{5+} , with simultaneous reduction of W^{6+} to W^{5+} ; however, the difference in the oxidation-reduction potentials of the systems, under proper conditions is such as to permit a complete reduction of Mo without affecting W. The curve obtained in the potentiometric titration of Mo^{6+} with $CrCl_2$ in an atm. of CO_2 shows a br. k corresponding to the reduction to Mo^{5+} and another that corresponds to the complete reduction to Mo^{4+} . Interference of W is prevented by adding $H_2C_2O_4$. *To det. Mo in alloys*, treat 0.25 g. of sample with 3-4 ml. of HF in a Pt dish. Add 1-1.5 ml. of HNO_3 and remove the excess with H_2O or CH_3COOH . Evap. the soln. to dryness and add 3 ml. of 20% NaOH. If necessary 10-15 ml. of water can be added to get a clear soln. Transfer to the titration vessel contg. 100 ml. of 0.1 N HCl, 10 ml. of concd. HCl, and 1 g. $H_2C_2O_4 \cdot 2H_2O$. The vessel should be fitted with a scaled stopper, buret, CO_2 inlet, and KCl bridge to the calomel cell. Heat to 80-90° and make an initial reduction by adding 3-4 ml. of $CrCl_2$ soln. Then add an excess of 0.1 N $K_2Cr_2O_7$ soln. and titrate the Mo^{5+} to Mo^{6+} . *To det. Mo in ore concentrates* fuse 0.5 g. of sample with a little $NaOH$ and 1-1.5 g. $NaOH$ in a crucible of Ag or Ni. Dissolve the cooled melt in 20-40 ml. of water and heat to boiling (if green, add a little K_2MnO_4 soln.). Filter, wash the residue with 2% Na_2CO_3 soln. Catch the filtrate in the titration vessel contg. 50 ml. of concd. HCl. Add oxalic acid and titrate as above. With low Mo it is better to measure the vol. between the second and third breaks. G. M. Kosolapov

State Sci. Res. Inst. Rare and
Fine Metals

ASB-55A METALLURGICAL LITERATURE CLASSIFICATION

CHERKASHINA, T. V.

**Rapid Method for the Analysis of Tungsten and Molybdenum Alloys.*
V. G. Goryushina and T. V. Cherkashina (*Zavod. Lab.*, 1948, 14, (7), 873-874).—[In Russian]. A sample consisting of 0.2 g. of finely divided alloy is placed in a 250-cc. beaker, and 10 ml. of cold saturated oxalic acid solution and 2-3 ml. of H_2O_2 are run in. The beaker is covered with a watch glass and gently heated until the alloy has entirely dissolved; excess of peroxide is then driven off by boiling. The solution is transferred to a titration flask containing 75 ml. HCl (2:1) and titrated in the usual way with 0.1N $CrCl_3$ solution, using a potentiometric method to determine the end-point. Some results obtained in this way on ferro-tungsten, ferro-molybdenum, and a Mo-W alloy agree well with gravimetric determinations.—N. H. V.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

AUTHORS: Chernikhov, Yu. A., Cherkashina, T. V. SOV/32-24-9-4/53

TITLE: The Analysis of Antimonous and Arsenous Indium and Arsenous Gallium (Analiz sur'myanistogo i mysh'yakovistogo indiya i mysh'yakovistogo galliya)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 9, pp 1057-1058 (USSR)

ABSTRACT: The alloys analyzed in the present paper have been produced from metals of high purity. In the analysis, a heated mixture of sulfuric acid and ammonium sulfate was used as a solvent. In the solutions thus obtained, antimony could be titrated by the bromatometric method. Arsenic was determined in the same way. The presence of indium and gallium did not interfere with the determinations, as each of these elements has not more than one valence stage. A table of the analyzed samples is given. The titrations were carried out potentiometrically or visually, in the presence of methyl red. A mixture of rhenium and antimony, corresponding in its composition to the intermetallic compounds ReSb, could also be analyzed by the procedure described. Although rhenium has several valences, it did not interfere with the determination. A table of results is given. A determination

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SOV/32-24-9-4/53

The Analysis of Antimonous and Arsenous Indium and Arsenous Gallium

method of this kind, developed at the same time by other authors (Ref 1), is more complicated and time-consuming. A description is given of the analysis procedure in connexion with the present method.

There are 2 tables and 1 reference.

ASSOCIATION: Gosudarstvennyy Nauchno-issledovatel'skiy institut redkikh i malykh metallov (State Scientific Research Institute of Rare and Trace Metals)

Card 2/2

CHERKASHINA, T.V.; VLADIMIROVA, V.M.

Present-day status of the analytical chemistry of gallium, indium, and thallium (survey). *Zav. lab.* no.11:1307-1318 '59. (MIRA 13:4)
(Gallium --Analysis) (Indium-- Analysis) (Thallium --Analysis)

5(2)

AUTHORS:

Chernikhov, Yu. A., Cherkashina, T. V.

SOV/32-25-1-15/51

TITLE:

Analysis of Intermetallic Alloys (Analiz intermetallicheskikh splavov)

PERIODICAL:

Zavodskaya Laboratoriya, 1959, Vol 25, Nr 1, pp 26-27 (USSR)

ABSTRACT:

A previous paper (Ref 1) contained the description of the analysis of binary semiconductor alloys In-Sb, In-As, Ga-As, Re-Sb. In the case of ternary alloys the calculation of the third component content from the difference leads to greater errors. Methods were worked out for the Sb-Al-Ga alloy (supplied by the Leningradskiy fiziko-tekhnicheskii institut Akademii nauk SSSR) (Leningrad Physico-Technical Institute, Academy of Sciences, USSR), in which each of the three metals is determined separately. Antimony was determined bromometrically. Aluminum was determined by titration of an excess of Trilon B with a thorium nitrate solution in addition to alizarin S as indicator and with pH = 3.5. Since antimony and gallium disturb the determination of aluminum, they are separated from the latter by extraction with butyl acetate (Ref 5) from 6 n hydrochloric acid. From the butyl acetate extract,

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SOV/32-23-1-15/51

Analysis of Intermetallic Alloys

Ga and Sb are extracted with water containing tartaric acid and gallium is trilonometrically determined with zinc, eriochrome black T serving as indicator (Refs 5,6). The disturbing influence of antimony, which causes the indicator to oxidize (Ref 7) is eliminated by an addition of ammonia. The described course of analysis was checked and confirmed with synthetic mixtures and alloys (Tables 1,2). There are 2 tables and 7 references, 4 of which are Soviet.

Card 2/2

L 52280-65 EWT(m)/EPF(n)-2/ENG(m)/EPR/ENF(t)/ENP(b) PS-L/Pu-L IJP(c)

JD/JG

ACCESSION NR: AT5012670

UR/2513/65/015/000/0080/0087

AUTHOR: Notkin, M.A.; Petrova, Ye. I.; Cherkashina, T.V.; Chernikhov, Yu. A.

TITLE: Concentration of impurities in the analysis of refractory metals (titanium, tantalum, niobium, and vanadium)

SOURCE: AN SSSR. Komissiya po analiticheskoy khimii. Trudy, v. 15, 1965. Metody kontsentrirvaniya veshchestv v analiticheskoy khimii (Methods of concentrating substances in analytical chemistry), 80-87

TOPIC TAGS: refractory metal analysis, titanium analysis, tantalum analysis, niobium analysis, vanadium analysis, impurity concentration, spectroscopic analysis, diethyldithiocarbamate

ABSTRACT: To concentrate microquantities of impurities in the spectral analysis of refractory metals, the authors employed group extraction. In the case of Ti, Ta, and Nb, the impurities present in these elements were dissolved in a mixture of hydrofluoric and nitric acid, then extracted with sodium diethyldithiocarbamate. At pH 6.0-6.5 in the presence of fluoride ions and tartaric acid, 19 elements were extracted, including 14 to the extent of 85% or over: Cu, Ag, Au (III), Mn(II), Pb, Zn, Fe(III), Cd, Ni, Co, In, Tl(I), Tl(III), Bi(III), and Se(IV). Ga, V(IV), Pt(IV), and Sn(IV) were extracted to the extent

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L 52280-65

ACCESSION NR: AT5012670

of 50% or less, and Sb was not extracted because it was in the pentavalent state. Carbon tetrachloride or chloroform can be used for the extraction of the diethyldithiocarbamates. In the case of vanadium, the latter was converted to the pentavalent state, and extraction with diethyldithiocarbamate separated 13 elements: Cu, Ag, Au(III), Mn(II), Pb, Zn, Fe(III), Cd, Ni, Co, In, Tl(I), Tl(III), and Bi. Ga, Pt(IV), Sn(IV), Sb(V), and Se(IV) were not extracted. The concentrates obtained were analyzed photographically with a medium-dispersion quartz spectrograph (ISP-22 or ISP-28). Another successful method of concentration applicable to tantalum, niobium, and vanadium consists of extracting the base element (Ta with cyclohexanone from 0.4 M HF and 1.2 M H₂SO₄; Nb with amyl acetate from 11 N HCl; V with tributyl phosphate from 6 N HCl). The analytical procedure employed is described in full. Orig. art. has: 1 table and 1 formula.

ASSOCIATION: Komissiya po analiticheskoy khimii, AN SSSR (Commission on Analytical Chemistry, AN SSSR)

SUBMITTED: 00

ENCL: 00

SUB CODE: IC, MM

NO REF SOV: 003

OTHER: 004

2/2

BOYENKO, I.D.; ZAV'YALOV, A.V.; CHERKASHINA, V.L.

Some new methodological works on the course in sports physiology.
Uch.zap.Chit.gos.ped.inst. no.8:120-125. '63. (MIRA 17:4)

BOYENKO, I.D.; VASILOV, S.I.; CHERKASHINA, V.L.

Changes in muscle contractility during interoceptive stimulation.
Fiziol.zhur. 46 no.2:210-213 F '60. (MIRA 14'5)

1. From the Departments of Physiology and of Physics, Medical Institute,
Chita.

(MUSCLE)

(DIGESTIVE ORGANS)
(CAROTID ARTERY)

(CAROTID SINUS)

SHUYKIN, N.I.; CHERKASIN, M.I.; GAYVORONSKAYA, G.K.

Catalytic isomerization of dicyclopentadiene under the pressure of
hydrogen media. Izv.AN Otd. tekhn.nauk no.5:626-628 My '58.

(MIRA 11:7)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR.
(Dicyclopentadiene) (Hydrogen)

CHERKAS'KA, R.Yu.

ZHUKOVSKIY, L.I.; CHERKAS'KA, R.Yu.

clinical aspects of primary cancer of the liver. Medych.zhur.
24 no.3:91-95 '54. (ML3A 8:10)

1. Kiivs'kiy medichniy institut, kafedra gosptal'noi tera-
pevtichnoi kliniki.
(LIVER, neoplasms,
clin.aspects)

BRASLAVS'KA, O.P.; CHERKAS'KIY, V.L.

Observations on the dormant state of *Euglena gericulata* Duj. under
light and in the dark. Bot.zhur. [Ukr] 11 no.2:55-62 '54. (MLRA 8:7)
(Flagellata)

1. CHERKASOV, A.
2. USSR (600)
4. Public Works
7. Planning and organization of public services in Piatigorsk. Zhil.-kom.khoz. 12
no. 10, 1952.

9. Monthly List of Russian Accessions, Library of Congress, March 1953, Unclassified.

SEREDA, V., prof.; ~~CHERKASOV~~, A., inzh.

High-frequency vibrating installation for unloading bulk goods.
Muk.-elev. prom. 25 no.11:28-30 N '59. (MIRA 13:3)

1. Khar'kovskiy institut inzhenerov zheleznodorozhnogo transporta
im. S.M. Kirova.
(Loading and unloading) (Railroads--Freight-cars)

SEREDA, V.; doktor tekhn.nauk; CHERKASOV, A., inzh.;
VISHNEVETSKIY, Ye., inzh.

Packing grain in freight cars by means of vibration. Muk.-elev.
prom. 27 no.8:27 Ag '61. (MIRA 14:7)

1. Khar'kovskiy institut inzhenerov zheleznodorozhnogo transporta
imeni S.M. Kirova.
(Grain--transportation rail)

LEVKOV, Ernst Arkad'yevich; CHERKASOV, A., red.

[Mineral resources of White Russia] V nedrakh zemli
Belorusskoi. Minsk, Izd-vo "Belarus'," 1964. 121 p.
(MIRA 17:6)

TSIGLER, V., kand.tekhn.nauk; BULAKH, V., inzh.; CHERKASOV, A., inzh.

Using kaolin daub in combustion chamber diffusers of auxiliary
marine boilers. Mor. flot 23 no.5:31-33 '63. (MIRA 16:9)

1. Nachal'nik laboratorii Ukrainskogo nauchno-issledovatel'skogo
instituta ogneuporov (for TSigler). 2. Ukrainskiy nauchno-issledo-
vatel'skiy institut ogneuporov (for Bulakh). 3. Sluzhba sudovogo
khozyaystva Chernomorskogo parokhodstva (for Cherkasov).
(Boilers, Marine—Maintenance and repair)

GRYZOV, I.S., inzh; BYSTRITSKIY, V. Ya., inzh.; NIKOL'SKIY, V.A., inzh.;
CHERKASOV, A.A., inzh.

New method of turbodrilling without raising the drilling
pipes. Bezop. truda v prom. 8 no.9:39-41 S '64 (MIRA 18:1)

1. Ob'yedineniye Saratovgazneft'.

C H E R K A S O V , A L E K S A N D R A L E K S E E V I C H

✓ 71-14 551.579.5:631.6 631.6(02)
Cherkasov, Aleksandr Alekseevich. Melioratsiia i sel'skokhoziaistvennoi vodosnabzhenie.
[Conservation and water supply for agriculture.] 3rd ed. Moscow, Gos. Izdat. Sel'skokh-
oziaistvennoi Lit., 1950. 536 p. 231 figs., 151 tables, refs., eqs. DLC--In this book on GP
irrigation and conservation of moisture in the soil, there are chapters on various types of
irrigation, including sprinkling on a large scale. On p. 190-192 is given a method of calculating
the intensity of rainfall, from drop size distribution, etc. Prevention of soil erosion, salting,
gully and loss of soil moisture are also considered in detail. Subject Headings: 1. Soil
moisture conservation 2. Drop size distribution 3. Irrigation 4. Irrigation textbooks.
—M.R.

CHERKASOV, A. A.

The Committee on Stalin Prizes (of the Council of Ministers USSR) in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for 1954 years 1953 and 1954. (Sovetskaya Rossiya, Moscow, No. 25-26, 26 Feb - 3 Apr 1954)

Name	Title of Work	Submitted by
Sokolov, N. S.	"Elements of Farming"	Moscow Agricultural Academy
Yarkov, S. P.	(textbook)	imeni K. A. Timiryazev
Chizhevskiy, M. G.		
<u>Cherkasov, A. A.</u>		
Shestakov, A. G.		
Gulyakin, I. V.		
Peterburgskiy, A. V.		
Troitskiy, A. N.		
Luk'yanyuk, V. I.		
Savzdarg, E. E.		
Trofimovich, A. Ya.		
Kuznetsov, V. S.		
Kudryavtsev, N. Ye		
Pronin, A. F.		
Alekhin, N. V.		
Sachli, S. N.		

Adm. - 10/10/54, 7 July 1954

CHERKASOV, A.A., inzhener.

Using soils with a humus content in hydrotechnical structures. Gidr.stroi.
22 no.6:12-16 Je '53. (MLRA 6:6)
(Dams)

CHERKASOV, A.

[Land improvement and agricultural water supply] Melioratsiia
i sel'skokhoziaistvennoe vodosnabzhenie. Izd. 4., perer.
Moskva, Gos. izd-vo selkhoz lit-ry, 1958. 375 p. (MIRA 12:1)
(Irrigation)

CHERNASOV, A.A., Cond Tech Sci --(disc) "Study of the ^{suitability} ~~feasibility~~
of ^{human soil} ~~method~~ ~~ground~~ for the building of earthen ^{engine} ~~hydr~~ engineering
~~structures~~ ^{structures}." Kharkov, 1959. 17 pp (Min of Higher Education
USSR. Khark'ov Construction Engineering Inst), ¹⁵⁰ ~~120~~ copies
(K1,30-59, 121)

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LATUKHIN, G.I.; GAGIN, N.R.; CHERKASOV, A.D.

Well head automatic packer. Neftianik 5 no.10:20-21 0 '60.
(MIRA 13:10)

(Packing (Mechanical engineering))

CHERKASOV, A.P., inzh.

Punching small holes in stainless and acidproof steel sheets.
Khim. mash. no. 6:40 N-D '61. (MIRA 15:2)
(Punching machinery)
(Sheet steel)

CHERKASOV, A.I.

Construction of centralized traffic control and communication
systems in a.c. electrified districts. Avtom., telem. i svyaz'
9 no. 1:20-23 J1 '65. (MIRA 18:8)

1. Glavnyy inzh. sluzhby signalizatsii i svyazi Yugo-Vostochnoy
dorogi.

Cherkasov, A. I.

CHERKASOV, A. I.

1. List of abbreviations: ...
2. ...
3. ...

4. Astrakhanskij tekhnicheskij institut ...
5. ...
(Hydrazobenzene-Spectra)

MEL'NIKOVA, A.S.; CHERKESOV, A.I.

Trilonometric determination of thorium with hematoxylin as
indicator. Zhur.VKHO 6 no.4:469-470 '61. (MIRA 14:7)

1. Astrakhanskiy institut rybnoy promyshlennosti i khozyaystva.
(Thorium--Analysis) (Hematoxylin)

SHKLOVSKIY, M. Ya.; CHERKASOV, A. N.; FISHLER, B. N.

The GEPK-130-17.5 swing cantilever railroad crane. Transp.
stroitel. 13 no.4:34-36 Ap '63. (MIRA 16:4)

1. Glavnyy tekhnolog mostostroitel'nogo tresta No. 2 (for Shklovskiy).
2. Starshiy inzhener Vsesoyuznogo nauchno-issledovatel'skogo institut transportnogo stroitel'stva Ministerstva transportnogo stroitel'stva (for Cherkasov).
3. Vedushchiy konstruktor Uglichskogo remontno-mekhanicheskogo zavoda (for Fishler).

(Cranes, derricks, etc.)
(Bridge construction—Equipment and supplies)

CHERKASOV, A. N.

Funktsiya s polnoy sistemoy stepeney. IAN, ser. matem., 7 (1943), 245-249.

SO: Mathematics in the USSR, 1917-1947
edited by Kurosh, A. G.,
Markushevich, A. I.,
Rashevskiy, P. K.
Moscow-Leningrad, 1948

PHASE I BOOK EXPLOITATION

8

CHERKASOV, Andrey Nikolayevich
Nemytskiy, Viktor Vladimirovich, Professor; Sludskaya, Maria Ivanovna;
and Cherkasov, Andrey Nikolayevich

Kurs matematicheskogo analiza, t. I (Course in Mathematical Analysis,
v. 1) 3d ed., enl. Moscow, Gostekhizdat, 1957. 486 p.
25,000 copies printed.

Gen. Ed.: Nemytskiy, Viktor Vladimirovich, Professor; Ed.:
Lapko, A..F.; Tech. Ed.: Gavrilov, S. S.

PURPOSE: The book is intended for university students, although the
content of the book exceeds the requirements of the teaching
program.

COVERAGE: The basic concepts of mathematical analysis, such as
sequence, limit of a sequence, function, limit of a function and
continuity of a function, are introduced, and the theory of

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Course in Mathematical (Cont.)

8

differential calculus developed. The application of differential calculus to the study of functions is presented and some mechanical problems are given. The general theory of series, the expansion of functions in power series, and the calculation of values of certain transcendental functions are presented. The basic theory of integral calculus is developed and its applications to geometry and to mechanics are given. There are no references.

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CHERKASOV, A. N.

Andrey Nikolayevich

Call Nr: QA 303. N43428

AUTHORS: Nemytskiy, V., Smolobkaya, M., Cherkasov, A. N.
 TITLE: A Course in Mathematical Analysis. Vol. II. (Kurs matematicheskogo analiza. Tom II)
 PUB. DATA: Gosudarstvennoye izdatel'stvo tekhniko-teoreticheskoy literatury, Moscow, 1957, 498 pp., 25,000 copies.
 ORIG. AGENCY: None
 EDITOR: Editorial Supervision: Nemytskiy, V., Professor; Editor: Ianko, A.F.; Tech. Editor, Yermakova, Ye. A.
 PURPOSE: The book was written as a textbook for the course of mathematical analysis at state universities and was approved as such by the Ministry of Higher Education of the USSR.
 COVERAGE: The present volume covers the expression of functions by infinite sequences and series of functions, differential calculus of functions with many variables, and integral calculus of functions.

Card 1/22

CHEBKASOV, Anatoliy Nikolayevich; ZHEREBKOV, I.V., red.; CHEKANOV,
A.A., tekhn.red.

[Methods for solving statics problems] Metodika reshenia
zadach po statike. Izd.2., dop. Rostov-na-Donu, Rostovskoe
knizhnoe izd-vo, 1958. 114 p. (MIRA 12:5)
(Statics)

2

16(1)

AUTHOR:

Cherkasov, A.N.

SOV/55-58-3-2/30

TITLE:

Remark on Linear Differential Equations of Second Order
(Zametka o lineynykh differentsial'nykh uravneniyakh vtorogo poryadka)

PERIODICAL:

Vestnik Moskovskogo universiteta, Seriya matematiki, mekhanika, astronomii, fiziki, khimii, 1958, Nr 3 pp 13-17 (USSR)

ABSTRACT:

With the aid of differential equations of Chaplygin and an auxiliary theorem the author proves the following theorem.
Theorem: Let the equation $y'' + p(x)y' + q(x)y = 0$ possess a unique solution, the coefficients are assumed to be bounded for $x \geq x_0$, $\sup_{x \geq x_0} q(x) = M < 0$. Then through every point of the plane there passes an integral curve $y = \varphi(x)$ for which it is $\lim_{x \rightarrow \infty} \varphi(x) = 0$.

ASSOCIATION:

Kafedra differentsial'nykh uravneniy (Chair of Differential Equations)

SUBMITTED:

August 13, 1957

Card 1/1

16(1)

AUTHOR: Cherkasov, A.N.

05266

SOV/140-59-5-22/25

TITLE: On the Solutions of the Equation $\frac{d^2x}{dt^2} = F(x, \frac{dx}{dt})$

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Matematika, 1959, Nr 5, pp 208-218 (USSR)

ABSTRACT: § 1. The author considers

$$(1) \quad \ddot{x} = F(x, \dot{x}),$$

where F is continuous and satisfies the Lipschitz condition in every domain lying in the upper or lower halfplane; $F(0,0) = 0$,

$F(x,0) \neq 0$ for $x \neq 0$; $\frac{F(x,y)}{y}$ for $x > 0$ and $|y| > d$ bounded;

$$\lim_{y \rightarrow 0} \left| \frac{F(x,y)}{y} \right| = \infty. \text{ Putting}$$

$$(2) \quad \ddot{x} = U,$$

then instead of (1) one obtains

$$(3) \quad \frac{dU}{dx} - \frac{F(x,U)}{U} = 0.$$

Let $W(x)$ with its derivative be continuous on $0 < x < 1$; $W(x) < 0$;

$\lim_{x \rightarrow 0} W(x) = 0$. Let

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On the Solutions of the Equation $\frac{d^2x}{dt^2} = F(x, \frac{dx}{dt})$

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SOV/140-59-5-22/25

$$(4) \quad \delta_W(x) = \frac{dW}{dx} - \frac{F(x, W)}{W}.$$

Theorem 1: If there exists a positive $\xi < 1$ so that $\delta_W(x) > 0$ for $0 < x < \xi$, then (3) has an integral curve ending in the origin and for $0 < x < \xi$ lying below $W(x)$.

Theorem 2.3 has a similar contents for other signs.

§ 2. Let $\varphi(t)$ and $\psi(t)$ be continuous with the derivatives for $t \geq 0$; $\varphi(t) > 0$, $\lim_{t \rightarrow +\infty} \varphi(t) = 0$; $\psi(t) < 0$, $\lim_{t \rightarrow +\infty} \psi(t) = 0$; $\varphi' < 0$,

$\lim_{t \rightarrow +\infty} \varphi' = 0$, $\psi' > 0$, $\lim_{t \rightarrow +\infty} \psi' = 0$. Let the reversion functions of

$\varphi(t)$, $\psi(t)$ be $\varphi_1(x)$, $\psi_1(x)$. The functions $W(x) = \left[\frac{d\varphi}{dt} \right]_{t=\varphi_1(x)}$ and

$W_1(x) = \left[\frac{d\psi}{dt} \right]_{t=\psi_1(x)}$ are said to be generated by φ and ψ .

Theorem 4.5: If for (1) there exists a function $\varphi(t)$ resp. $\psi(t)$ so that the generated function $W(x)$ resp. $W_1(x)$ according to (4)

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On the Solution of the Equation $\frac{d^2x}{dt^2} = F(x, \frac{dx}{dt})$

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leads to a $\delta_W(x)$ resp. $\delta_{W_1}(x)$ which remains positive on $0 < x < \xi$
resp. $-\xi < x < 0$, then there exists a solution of (1) which
satisfies the inequation $x(t) < \varphi(t)$ for $t \geq \varphi_1(\xi)$ resp. $x(t) > \psi(t)$
for $t > \psi_1(-\xi)$.

Further three similar and more special theorems and several
examples are given.

The author mentions S.A. Chaplygin.
There are 2 Soviet references.

SUBMITTED: June 9, 1958

Card 3/3

CHERKASOV, A.N. (Moskva)

Marginal extremes and the problems of linear programming. Mat. v
shkole no.2:16-22 Mr-Ap '62. (MIRA 15:3)
(Linear programming)

CHERKASOV, Andrey Nikolayevich; UGAROVA, N.A., red.

[Introduction to higher mathematics] Vvedenie v vysshuiu matematiku. Moskva, Nauka, 1964. 242 p. (MIRA 17:11)

CHERKASOV, A.N.; KLENIN, D.I.; BYENIN, Ye.Ye.

Determination of the diffusion coefficients of separate components
diffusing in a mixture. Vysokom. soed., 7 no.5:901-907 My '65.
(HEBA 18:2)

1. Institut vysokomolekulyarnykh soedineniy AN SSSR.

CHERKASOV, A.O. (Leningrad)

Compaction of sagging loams with high moisture content. Osn., fund.
i mekh. grun. 3 no.4:22 '61. (MIRA 14:8)
(Belovo--Soil compaction)

CHERNASOV, A. P.

"Approximate Method of Calculating Elastic Systems for Dynamic Stability." Cand Tech Sci, Khar'kov Construction Engineering Inst, Khar'kov, 1954. (RZh'ekh, Sep 54)

SO: Sun 432, 29 Mar 55

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 11, p 172 (USSR) SOV/124-58-11-13068

AUTHOR: Cherkasov, A. P.

TITLE: A Method for the Approximate Calculation of the Dynamic Stability of System of Rods (Priblizhennyy metod rascheta sterzhnevyykh sistem na dinamicheskuyu ustoychivost')

PERIODICAL: Tr. Khar'kovsk. inzh.-stroit. in-ta, 1957, Nr 5, pp 115-142

ABSTRACT: The author presents a method permitting approximate computation of dynamic stability of rods of varying cross section, continuous beams, and two versions of simple frames. In one particular case when the shape of the natural oscillations coincides with the shape of static buckling, the differential equation reduces to a system of ordinary second-order equations with periodic coefficients which may be broken down into separate independent equations of the Mathieu type; the method of finite differences with respect to a single variable is employed. In the case of a more general solution, the differential equation of the oscillation may be reduced to a single equation of the Mathieu type by means of solving certain systems of homogeneous algebraic equations;

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SOV/124-58-11-13068

A Method for the Approximate Calculation of the Dynamic Stability (cont.)

the method of finite differences is also employed. The function of the solution is considered to be dependent only upon the shape of deflection of a rod during its free vibration; this assumption does not introduce any substantial errors, provided the magnitudes of the periodic forces are small (the errors in the examples given were determined at 4.4%). Solutions are also derived for problems on dynamic stability of a stepped rod with abruptly changing cross section and a continuous beam with two unequal spans (the error in the latter instance amounts to 2.7%).

N. K. Snitko

Card 2/2

5(4)

AUTHORS:

Gromakov, S. D., Cherkasov, A. P.

SOV/76-32-11-1/32

TITLE:

On Methods of Calculating the Properties of Ternary and Quaternary Systems (K metodam rascheta svoystv troynykh i chetvernykh sistem) Viscosity and the Specific Gravity of the Non-Reciprocal Quaternary System Water - Methanol - Ethanol - Glycerin (Vyazkost' i udel'nyy ves chetvernoy nevzaimnoy sistemy voda - metanol - etanol - glitserin)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 11, pp 2473-2478 (USSR)

ABSTRACT:

The present paper was carried out to experimentally control the interpolation formulae (Refs 1,2) for calculating the systems mentioned in the title according to experimental data of binary systems. To carry out the investigation under "strictest" conditions a system was chosen the components of which differ greatly with respect to their properties. The viscosity determinations were carried out with an apparatus (Diagram) which in principle consisted of a rotating vessel with the liquid to be investigated, and an elliptic "fan" suspended in the liquid. The fan hangs from a flexible glass

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SOV/76-32-11-1/32

On Methods of Calculating the Properties of Ternary and Quaternary Systems.
Viscosity and the Specific Gravity of the Non-Reciprocal Quaternary System
Water - Methanol - Ethanol - Glycerin

rod. The rotation of the liquid is transmitted according to the viscosity by way of the fan to the glass rod which carries a mirror. This mirror reflects a light beam to a scale and thus indicates the relative viscosity. The measurements were carried out at 20°C, the error of measurement being $\pm 2\%$ (rarely $\pm 5\%$). The determinations of the specific gravity were carried out in pycnometers. The elaboration of the experimental data was carried out graphically according to the "net" method. It consists of the fact that the surface related to the property is orthogonally projected from the triangular prism composition - property on the selected plane. The equations valid for ternary systems (Ref 1) may also be used for quaternary systems (Ref 2). Certain points of the composition were calculated on a tetrahedron diagram (Diagram) as an example. The calculation on the basis of the numerical values of the properties of binary systems takes place in two stages. The calculation of properties of quaternary systems according to experimental data for ternary systems can be carried out as well. A comparison of the calculation

Card 2/3

SOV/76-32-11-1/32
On Methods of Calculating the Properties of Ternary and Quaternary Systems.
Viscosity and the Specific Gravity of the Non-Reciprocal Quaternary System
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data shows that the results from the data of ternary systems agree better with the experimental data. The data of the specific gravities agree well to a maximum error of 0.5%. The values of viscosity differ by up to 10-15%, so that in this respect only approximate values can be obtained. There are 4 figures, 2 tables, and 2 Soviet references.

ASSOCIATION: Kazanskiy gosudarstvennyy universitet im. V. I. Ul'yanova-Lenina (Kazan' State University imeni V. I. Ul'yanov-Lenin)

SUBMITTED: February 25, 1957

Card 3/3

VINOKUROV, Lev Pinkhusovich; KOLESNIKOV, L.A., kand. tekhn. nauk, retsen-
zent; CHERKASOV, A.P., kand. tekhn. nauk, retsenzent; ALEKSEYEV,
Yu.N., kand. tekhn. nauk, retsenzent; KAN, S.N., prof., doktor
tekhn. nauk, otv. red.; KURILOVA, T.M., red.; SMILYANSKAYA, T.M.,
tekhn. red.

[Structural mechanics of rod systems; theory of the deformation of
rod systems] Stroitel'naya mekhanika sterzhnevyykh sistem; teoriya
deformirovaniya sterzhnevyykh sistem. Khar'kov, Izd-vo Khar'kovskogo
gos. univ. im. A.M.Gor'kogo. Pts. 2-3. 1961. 198 p. (MIRA 14:11)
(Beams and girders)

S/184/61/000/006/004/005
D041/D113

AUTHOR: Cherkasov, A.P., Engineer

TITLE: Punching of small-diameter apertures in stainless and acid-proof steel sheets

PERIODICAL: Khimicheskoye mashinostroyeniye, no. 6, 1961, 40

TEXT: The design and operation of a punching device (Fig.1), developed at the Sumskiy mashinostroitel'nyy zavod im. Frunze (Sumy Machine-Building Plant im. Frunze), is described. The device punches apertures 2.2 mm in diameter into sieves of stainless and acid-proof steel 1.5 mm thick. It consists of a punch holder with a set of 10 punches, made of P 18 (R18) steel and a die of 5X12C (5KhV2S) steel. The punch set can be changed within 3-5 minutes. After heat treatment, the punch has a hardness of RC 58-60. Before punching, the metal sheet is covered with a lubricant consisting of equal quantities of chalk and machine oil. Every punch set punches 130,000 apertures. In cooperation with the NIIKhIMMASH, the Sumy Plant is now developing the technology and equipment for punching apertures whose diameter corresponds to the thickness of stainless and acid-proof steel sheets to be punched. There is 1 figure.

Card 1/2

Punching of small-diameter apertures....

S/184/61/000/006/004/005
D041/D113

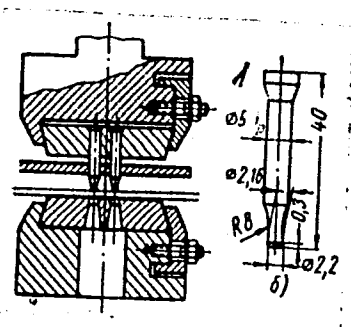


Fig.1.: Diagram of a punching device and a punch for punching apertures in stainless and acid-proof steel sheets.

Legend: (1) -- approximate value.

Card 2/2

L 15746-63

EMP(r)/EWT(m)/BDS AFFTC

ACCESSION NR: AR3002686

S/0124/63/000/005/V019/V019

SOURCE: Rzh. Mekhanika, Abs. 5V140

52

AUTHOR: Cherkasov, A.P.

TITLE: Effect of the transverse force and inertia of rotation of the cross section on the dynamic stability of rods *2b*

CITED SOURCE: Tr. Kher'kovsk. inzh.-stroit. in-ta, vyp. 16, 1961, 21-32

TOPIC TAGS: inertia, rotation, rod, shaft, stability, equation, oscillation, sag, bend, pulsation

TRANSLATION: The differential equation of oscillation of an elastic rod which supports an axial periodic force, with consideration of the effect of the transverse shift and the inertia of rotation of the cross section has the form

$$EJ \left(1 - \frac{P(t)}{GK'} \right) \frac{\partial^4 y}{\partial x^4} + P(t) \frac{\partial^2 y}{\partial x^2} + \rho_F \frac{\partial^2 y}{\partial t^2} - \left(\rho_J + \frac{\rho EJ}{GK'} \right) \frac{\partial^4 y}{\partial x^2 \partial t^2} + \frac{\rho^2 J}{GK'} \frac{\partial^4 y}{\partial t^4} = 0 \quad (1)$$

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where EJ is the bending moment, G is the shift modulus, F is the transverse cross sectional area, k' is the coefficient of the shape of the transverse cross section, ρ is the density, x is the axial coordinate, t is the time, y is the sag of the rod. The solution of equation 1 is presented in the form $y(x, t) = T(x) X(x)$. After the separation of variables, a system of three ordinary differential equations is obtained, one of which can be rewritten in the form of Mathieu's equation

$$\frac{d^2 T}{dt^2} + \varphi_n^2 (1 - \eta \cos \omega t) T = 0 \quad (2)$$

where φ_n is the frequency of the characteristic oscillations of the rod (taking account of the shift and the rotational inertia) and $\eta = P_{dyn}/Q_n$ (P_{dyn} is the amplitude of the external force, Q_n is the constant coefficient coinciding for the hinged support of the rod with the f value of the critical force if account is taken of the influence of the transverse shift) the pulsation coefficient is determined as a result of the solution of two other equations. The region of dynamic instability is determined indirectly from 2. The author comes to the conclusion that the calculation of the transverse shift and the inertia of

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ACCESSION NR: AR3002686

rotation of the cross section lower the dynamic instability of the rod. The small influence on the dynamic instability of the rotational inertia for a compound rod and of the transverse force for the rod with a solid cross section is noted. Examples are given for the calculation for a compound rod with rectangular transverse cross section. A.V. Ivanov

DATE ACQ: 14Jun63

SUB CODE: PH

ENCL: 00

Card 3/3

18(5), 25(1)

80V/135-59-8-17/24

AUTHOR: Cherkasov, A.S., Engineer

TITLE: A Gun for Tack-Welding Sheet-Steel Parts

PERIODICAL: Svarochnoye proizvodstvo, 1959, Nr 8, p 42 (USSR)

ABSTRACT: Until recently in the factory in which the author is working sheet-steel parts were tacked by electric arc welding. In this process the welds often burn through and have to be cleaned in a time-consuming smoothing process. In another plant a gun was introduced for tack-welding which is described in the following part of the article. The apparatus in question is a spot-welding gun which consists of a body and a moveable handle. When it is pressed against the spot which is to be welded the handle moves on the body and closes a circuit for the electronic device regulating the time. The article gives the data for the connection and suitable connectors. It is possible to weld with this gun parts with a total thickness up to 3 mm much faster than with the common arc welding. There is 1 diagram.

Card 1/1

VOLOVIK, V.D.; STRELKOV, G.P.; CHERKASOV, A.S.; CHURSIN, G.N.

Determining the moisture in sand from the attenuation of fast
neutron flux. Atom.energ. 16 no. 4:366-367 Ap '64. (MIRA 17:5)

CHERKASOV, A. S.

Mar 51

USSR/Chemistry - Antiknock Fuels

"Condensation of Benzene With Aliphatic Polyhalides Using $AlCl_3$ Prepared According to Radzivanovskiy," Chair of Org Chem, Leningrad State U, B. N. Dolgov, N. I. Sorokina, A. S. Cherkasov

"Zhur Obshch Khim" Vol XXI, No 3, pp 509-516

Condensed MeI, (I), iso-PrCl (II) iso-BuCl (III), and iso-AmCl (IV) with C_6H_6 in presence of $AlCl_3$ obtained by Radzivanovskiy method. Yields of monoalkylbenzenes declined in above order. Condensation of C_6H_6 with following yielded resp: with I up to 11.5% penta- and hexamethylbenzenes; with II-IV decreasing yields of di- and trialkylbenzenes as mol wt of radicals increased; with III and IV Chiefly Tert-Bu- and tert-Am C_6H_6 (linked with isomerization and splitting of iso- C_6H_{12} side chain; with $CHCl_3$ up to 38% Ph_2CH_3 and 3-4% Ph_3CH_3 .

176T28

CHERKASOV, A. S.
USSR/Chemistry

Card 1/1

Authors : Dolgov, B. N. ; and Cherkasov, A. S.

Title : Alkylation of benzene with alcohols and halogen derivatives of the fatty series over aluminum silicate catalysts

Periodical : Zhur. Ob. Khim. 24, Ed. 5, 825 - 833, May 1954

Abstract : Experiments showed that the basic reaction products at a molar ratio of the benzene and the alkylation agent of 4:1 are monoalkyl benzenes. Maximum yields of benzene alkylation products are obtained during alkylation with propyl alcohols and propyl halides. Alkylation of benzene with n-propyl alcohol and n-propyl bromide is followed by the isomerization of the alkyl group and the reaction product is isopropylbenzene. During alkylation with propylene the catalyst rapidly drops its activity. Reduction of catalyst activity is much slower during alkylation with alcohols and alkyl halides. The catalyst deactivated for the alkylation reaction with propylene remains inactive for the alkylation with alcohols but is still active for the reaction of alkylation with alkyl halides. Fifteen references. Tables, graphs.

Institution : The A. A. Zhdanov State University, Leningrad

Submitted : December 28, 1953

CHERKASOV, A.S.

¹¹ Absorption and luminescence investigation of some meso-aryl and meso-alkyl anthracene derivatives. A. S. Cherkasov. *Zhur. Fiz. Khim.* 26, 2581-17 (1956).—Absorption spectra, fluorescence spectra, and fluorescence yields of anthracene, 9-methylanthracene, 9-ethylanthracene, 9-propylanthracene, 9-butylanthracene, 9-isobutylanthracene, 9-phenylanthracene, 9,10-dimethylanthracene, 9,10-dipropylanthracene, 9,10-diphenylanthracene, 9-phenyl-10-(1-naphthyl)anthracene and 9,10-di-1-naphthylanthracene have been studied. The absorption and fluorescence spectra of these anthracene derivs. are displaced towards the longer wave lengths against the anthracene spectra. The displacement of the disubstituted derivs. is nearly double that of the monosubstituted compds. The fluorescence spectra of the propylanthracenes are considerably more diffuse than the absorption spectra, and the mirror similarity is destroyed. The fluorescence quantum yields of the alc. solns. of the 9-monoalkyl and 9-monoaryl anthracenes are 1.5-2 times higher than of the anthracene solns., while the fluorescence quantum yields of the disubstituted anthracene derivs. are approx. double the yields of the corresponding monosubstituted compds., and approach the value of 1. In the alkyl substituted anthracenes, the quantum yield increases with an increase in the mol. wt. of the substituents.

W. M. Sternberg

CHERKASOV A. S.
USSR/Physical Chemistry - Molecule, Chemical Bond.

B-4

Abs Jour : Referat Zhur - Khimiya, No 1, 1958, 95

Author : A.S., Cherkasov, T.M. Vember.

Inst :

Title : Absorption and Luminescence of Mesoderivatives of Anthracene with Oxygen Containing Substitutes.

Orig Pub : Optika i spektroskopiya, 1956, 1, No 5, 663-671

Abstract : The ultraviolet absorption spectra (AS) and fluorescence spectra (FS) of solutions of anthracene, 9-acetylanthracene, 9-benzoylanthracene, 9-anthracenecarboxylic acid, 9-acetoxyanthracene, 9-metoxyanthracene, 9-chloro-10-anthracenecarboxylic acid, 9-bromo-10-anthracenecarboxylic acid, 9, 10-diacetoxyanthracene, 9,10,-dimetoxyanthracene, 9-methyl-10-metoxyanthracene, 9-chloro-10-metoxyanthracene and 9-bromo-10-metoxyanthracene in ethyl alcohol were studied. The absorption spectra have the appearance characteristic of anthracene. The influence of substitutes

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Abs Jour : Ref Zhur ~ Khimiya, No 1, 1958, 95

is expressed in a certain diffusion of the vibration structure of the long-wave band and in the shift of spectra to the lower frequency side. The fluorescence spectra are more sensitive of substitutes. The diffusion of the vibration structure of bands is the greatest, if there were no steric hindrances for the rotation of the substitutes. It is obvious that the position of the substitute with reference to the ring in such a case is such that its interaction with the ring is the greatest. The shift of AS and FS of di-replaced anthracene is approximately equal to the sum of shifts caused by each substitute separately. The introduction of electron-acceptor substitutes (CH_3CO , $\text{C}_6\text{H}_5\text{CO}$, COOH) results in a complete or nearly complete disappearance of fluorescence. Substitutes of the electron-donor character decrease the fluorescence emission considerably less. As compared with the

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Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 95

monoderivatives, the fluorescence emission of diderivati-
ves is greater as a rule, if both the substitutes were
of the same type with reference to their influence on the
distribution of electrons in the anthracene nucleus.
The oscillator forces were computed for all compounds.
See also RZhKhim, 1956, 53634.

Card 3/3

CHERTASOV A.S.

Absorption and fluorescence spectra and quanta emission of fluorescence
of some mesosubstituted anthracenes. Izv. AN SSSR Ser.fiz, 20 no.4:478-
481 Ap '56. (MIRA 10:1)

(Luminescence) (Fluorescence)

CHERKASOV, A. S.

USSR/Physical Chemistry, Photo Chemistry, Radiation Chemistry,
Theory of Photographic Process.

B-10

Abs Jour : Ref Zhur - Khimiya, No 7, 1957, 22450.

Author : A. S. Cherkasov, V. A. Molchanov, T. M. Vember, K. G. Voldaykina.

Inst : Not given

Title : Fluorescence duration of anthracene mesoderivatives.

Orig Pub : Dokl. A.N. USSR, 1956, 109, No 2, 292-294.

Abstract : Average durations of fluorescences (τ_e) of anthracene solutions (A) and 46 of its mesoderivatives (alkyl-, aryl-, galogeno-amino-, acetyl-nitro-, methoxy- and a series of others replaced by (A) are measured on a phase-fluorometer in C_2H_5OH at indoor temperature. Values of τ_e for the indicated A-derivatives lie in the range of $1.0-12.0 \cdot 10^{-9}$ sec. Values of τ_e divided by the amount of the absolute quantum yield of substances of fluorescence (η) measured in the same conditions, are compared with the maximum span of life of the 1st excited state of τ_a , obtained from the area of the long wave band of absorption of the A derivative solutions. It is shown, that the values τ_e/η and τ_a coincide better if the computation of τ_a will be effectuated on the basis of the formula proposed by

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USSR/Physical Chemistry, Photo Chemistry, Radiation Chemistry,
Theory of Photographic Process.

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Abs Jour : Ref Zhur - Khimiya, No 7, 1957, 22450.

Forster (Forster T. Fluoreszenz organischer Verbindungen,
Gottingen 1951, S.158) than by usual formula of Kravz-Einstein.
 τ_a and $\tau_{e,n}$ (n concords well in case of derivatives at which
 n is greater than at Λ). The diminishing of the value of τ ,
 $\tau_{e/n} > \tau_a$ in case of substitutes is explained in this case by
the presence of damping, not related to the decrease of τ .

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PRIKHOT'KO, A.F.

24(7)

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PHASE I BOOK EXPLOITATION SOV/1365

L'vov. Universitet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Fizichnyy zbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Gazer, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Landsterg, G.S., Academician (Resp. Ed., Deceased), Noporent, B.S., Doctor of Physical and Mathematical Sciences, Pabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Pabzikant, V.A., Doctor of Physical and Mathematical Sciences, Kornitkiy, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanovich, V.S., A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

Yeliseyev, Yu. A., L.A. Igumov, and A.N. Shabadash. Vacuum Container for the IR-1 Infrared Spectrometer

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Gashkovskiy, V.P. Complex Structure and Nature of the Absorption Spectra and Fluorescence of Magnesium Phtalocyanine and Chlorophyll

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Gurinovskiy, G.P., I.N. Yermolenko, A.N. Sevchenko, and K.M. Solov'yev. Electron Spectra of Chlorophyll and Pheophytine and Metal-derivatives

375

Cherkasov, A.S. Effect of Spacing of Substitutes on the Absorption Spectra and Fluorescence of Meso-derivatives of Anthracene

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Finkel'shteyn, A.I., N.I. Malkina, and G.P. Machin. Absorption Spectra in the Ultraviolet Range and the Molecular Structure of Triazine Derivatives

385

Card 24/30

51-4-2-10/28

AUTHORS: Cherkasov, A. S. and Bember, T. M.

TITLE: On Kinetics of Photochemical Transformations and Concentration Quenching of Fluorescence of 9-Monoalkyl Derivatives of Anthracene. (O kinetike fotokhimicheskikh prevrashcheniy i kontsentratsionnom tushenii fluorestsen-tsii 9-monoalkilzameshchennykh antratsena.)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol.IV, Nr.2, pp.203-210 (USSR).

ABSTRACT: Mesoalkyl derivatives of anthracene can be photo-oxidized and photodimerized (Ref.8). To find out how these photochemical processes affect fluorescence yield, the authors studied concentration dependences of quantum yields of photoreactions and of fluorescence for 9-methyl-, 9-ethyl-, and 9-n-propyl-anthracenes. Photochemical reaction rates were studied using the apparatus shown in Fig.1. A solution of the substance studied was mixed with stirrer 1. Air was passed continuously through tube 2. Temperature was measured with a thermometer 3. The apparatus was kept at constant temperature within $\pm 0.5^{\circ}\text{C}$. In all cases ethyl alcohol was used as the solvent. The solution was illuminated by a mercury lamp 5

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Quenching of Fluorescence of 9-Monoalkyl Derivatives of Anthracene.

through a window 6. A filter 7 separated out a group of lines near 365 mμ. A photomultiplier was used as a receiver. Reaction rates were obtained from a decrease of concentration of the substance studied by measurement of the optical density of the solution. The quantum yields of photoreactions were calculated from the reaction rates of the anthracene derivatives compared with the rate of photodecomposition of oxalic acid in presence of uranyl oxalate, taking the quantum yield for oxalic acid decomposition to be 0.5. The relative fluorescence yields were found from the relative intensities of fluorescence at the same frequency and same conditions of excitation and observation. Fig.2 shows the concentration dependences of the quantum yields for photo-oxidation and photodimerization and the sum of these quantum yields for 9-methylantracene, 9-ethylantracene and 9-n-propylantracene. The total quantum yield of both photoreactions increases with concentration of the substance studied. Fig.3 shows that the concentration dependences of the quantum yield of fluorescence of the

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three alkyl derivatives of anthracene are almost the same. Increase of concentration of methyl-, ethyl- and n-propyl-anthracene from 10^{-5} mole/litre (when the concentration quenching is absent) to 2×10^{-2} mole/litre decreases the quantum yields of fluorescence from 0.25 to 0.14, from 0.30 to 0.17 and from 0.31 to 0.18, for the three anthracene derivatives respectively. Figs. 3b, 4 and 5 show respectively dependence of the reciprocal of fluorescence yield on concentration, dependence of the reciprocal of the total photoreaction quantum yield on the reciprocal of concentration, and dependence of the quantum yield of fluorescence on the total photoreaction quantum yield. In all cases the continuous curves calculated theoretically are in good agreement with experimental points represented by circles. Fig. 6 shows dependence of the reciprocal photo-oxidation quantum yield on the reciprocal of concentration. The results given in these figures and in Tables 1-2 show that the concentration quenching of fluorescence of the three compounds studied is due to photochemical reactions in

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Quenching of Fluorescence of 9-Monoalkyl Derivatives of Anthracene.

51-4-2-10/20

them. The authors determined rate constants for photochemical reactions, quenching constants for fluorescence and limiting values of the quantum yields for photochemical reactions and fluorescence (Table 3). There are 6 figures, 3 tables and 15 references of which 3 are English and American, 2 German, 1 French, 2 Soviet and 2 mixed (Soviet and Western).

ASSOCIATION: State Optical Institute imeni S.I. Vavilov.
(Gos. opticheskiy institut im. S.I. Vavilova.)

SUBMITTED: April 3, 1957.

1. Anthracenes-Fluorescence-Effects of photochemical reactions

Card 4/4

AUTHORS: Cherkasov, A.S., Tishchenko, G.A. and Voldaykina, K.G. 51-4 -3-9/30

TITLE: Photoluminescent Characteristics and Relative Intensities of Scintillations of Plastic Scintillators Containing Anthracene Derivatives.
(O fotolyuminestsentnykh kharakteristikakh i otnositel'nykh intensivnostyakh stsintillyatsiy plasticheskikh stsintillyatorov s proizvodnymi antratsena.)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol.IV, Nr.3, pp. 344-347 (USSR)

ABSTRACT: Anthracene was one of the first substances used to make plastic scintillators (Ref.1). The authors studied scintillators which contained various derivatives of anthracene. These scintillators were prepared by polymerization of styrene in which the studied substance (2% by weight) was dissolved. The relative magnitudes of scintillation pulses under the action of γ -rays and the fluorescence spectra, quantum yields of fluorescence and durations of the excited state of the scintillators were studied. Samples were prepared and their scintillation efficiency was measured at the Institute of High-Molecular Compounds of the Academy of Sciences

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Photoluminescent Characteristics and Relative Intensities of
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Derivatives.

of the USSR in M.M. Koton's laboratory. Fluorescence was excited by mercury lines of about 365 mμ wavelength. Quantum yields were found from the ratios of areas bounded by fluorescence spectra. Durations of the excited state were measured by means of a fluorometer as described in Ref.3. The relative magnitudes of scintillation pulses obtained using various derivatives of anthracene are given in the table on p.345. For derivatives with alkyl, aryl, methoxy-, acetoxy- and acetylamino-groups in meso-positions of the anthracene nucleus or alkyl substituents in α- and β-positions of anthracene an increase of the pulse heights is observed compared with plastic scintillators containing anthracene itself. The most effective are diaryl derivatives of anthracene, particularly 9,10-diphenyl and 9,10-di-(n-anisyl)-anthracene (their efficiency is of the same order as that of scintillators with terphenyl). Introduction of methyl groups into phenyl rings or into m- and n-positions of diphenylanthracene lowers the

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Photoluminescent Characteristics and Relative Intensities of Scintillations of Plastic Scintillators Containing Anthracene Derivatives.

relative pulse height, compared with the most effective compounds. From the relative quantum yields and the known value of the absolute quantum yield of fluorescence of anthracene dissolved in benzene, the absolute quantum yields of fluorescence of scintillators with anthracene derivatives were calculated. In almost all compounds studied here the absolute quantum yields are high, and in the case of diaryl derivatives they are close to unity (see table on p.345). The authors conclude that of the studied anthracene derivatives the best scintillators can be obtained using mesoaryl derivatives of anthracene, whose scintillations are 2.5-3 times more intense than anthracene scintillations. The same scintillators have also the shortest duration of the excited state (of the order of 10^{-8} sec). The high relative intensity of scintillations of mesoaryl derivatives of anthracene is due to their high quantum yields of fluorescence, nearness of the fluorescence

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Derivatives.

maximum to the maximum of photomultiplier intensity
and good transparency for their own fluorescence.
There is 1 table, 1 figure and 4 references, of which
2 are Soviet, 1 American and 1 English.

ASSOCIATION: State Optics Institute imeni S.I. Vavilov.
(Gosudarstvennyy opticheskiy institut im. S.I. Vavilova.)

SUBMITTED: June 21, 1957.

1. Scintillation counters--Materials--Properties 2. Anthracenes
--Derivatives--Applications

Card 4/4

Cherkasov A.S.

51-4-5-11/29

AUTHORS: Tischchenko, G.A., Sveshnikov, B. Ya. and Cherkasov, A.S.

TITLE: On the Dependence of the Fluorescence Spectra of Meso-Derivatives of Anthracene on the Concentration of the Solute (O zavisimosti spektrov fluorestsentsii rastvorov mezozameshchennykh antratsena ot kontsentratsii rastvorennogo veshchestva)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol IV, Nr 3, pp 651-656 (USSR)

ABSTRACT: Förster and Kasper (Ref 1) discovered that in concentrated solutions of pyrene a considerable deformation of the luminescence spectra occurs, which is not accompanied by changes in the absorption spectra and which cannot be explained by re-absorption of the short-wavelength portion of the emitted spectrum. Förster and Kasper explained the observed effect by emission by dimers formed as a result of collisions of excited molecules with non-excited ones, which is superimposed on the emission of monomers. A similar effect was observed by the present authors in the study of concentration quenching of fluorescence of meso-derivatives of anthracene. The authors studied benzene and acetone solutions of 9-methyl-, 9-n-propyl-, 9-n-butyl-, 9-phenyl-, 9,10-diphenyl-

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On the Dependence of the Fluorescence Spectra of Meso-Derivatives of Anthracene
on the Concentration of the Solute

and 9,10-dimethylantracene prepared by A.S. Cherkasov, T.M. Bamber and K.G. Voldaykina. The method of study was the same as in Ref 3. The apparatus consisted of a mercury lamp SVDSH-250, and a monochromator with a diffraction grating and a photomultiplier. The observations were made on the side of excitation with the 366 mμ line. Figs 1 and 2 show the fluorescence spectra of benzene solutions of 9-n-propylantracene and 9,10-diphenylantracene. For other alkyl-derivatives of anthracene similar results were obtained to those for 9-n-propylantracene. Fig 3 shows the fluorescence spectrum of anthracene in benzene. Fig 4 gives the concentration quenching of fluorescence of anthracene and its derivatives dissolved in benzene. Table 1 gives the duration of fluorescence of benzene solutions of 9,10-diphenylantracene and of pyrene as a function of the concentration of the solute. A new long-wavelength fluorescence band was found in the spectra of concentrated solutions of the above alkyl-derivatives of anthracene in benzene. This new band exhibits comparatively long-lived emission in contrast to the fundamental fluorescence band whose intensity decreases with the solute concentration. The absorption spectra of the substances

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studied were found to be independent of the solute concentration. Following Förster and Kasper (Ref 1) the authors suggest that the observed effects are due to dimerization of excited molecules. There are 4 figures, 2 tables and 6 references, 4 of which are Soviet, 1 German and 1 American.

ASSOCIATION: Gosudarstvennyy opticheskiy institut im. S.I. Vavilova
(State Optical Institute imeni S.I. Vavilov)

SUBMITTED: June 28, 1957

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1. Anthracene - Meso derivatives - Fluorescence spectra
2. Molecules - Excitation
3. Molecules - Collision